

I CLAIM:

1. An apparatus for measuring rotational speed of a bladed rotor, comprising a plurality of blades, at least one of said blades including an electrically conductive material at a location adjacent a tip portion, said bladed rotor encircled by a shroud, the apparatus comprising:
 - a permanent magnet supported by the shroud and providing a permanent magnetic field, the magnetic field distributed across a space of sufficient size to extend to intersect said location;
 - a magnetic variation detection unit supported by the shroud and disposed adjacent the permanent magnet at least partially within said space, the unit adapted to provide a signal in response to a variation of said permanent magnetic field; and
 - a processing unit receiving said signal and providing said rotational speed.
2. The apparatus as claimed in claim 1, further comprising a spacer located between said permanent magnet and said magnetic variation detection unit.
3. The apparatus as claimed in claim 1, wherein said magnetic variation detection unit comprises a Giant Magneto Resistance (GMR) switch.
4. The apparatus as claimed in claim 1, wherein said magnetic variation detection unit includes at least one Giant Magneto Resistance (GMR) resistor.

5. The apparatus as claimed in claim 3, wherein said Giant Magneto Resistance (GMR) switch sits in an abradable surrounding the tip of the plurality of blades.
6. The apparatus as claimed in claim 1, wherein the magnetic variation detection unit is disposed intermediate the permanent magnet and the at least one blade.
7. The apparatus as claimed in claim 1, wherein the at least one of said blades includes substantially all of the plurality of said blades.
8. The apparatus of claim 1, wherein the apparatus is in a gas turbine engine, the bladed rotor is the fan, and the apparatus provides fan speed information for use in operation of the gas turbine engine.
9. An apparatus for measuring at least a rotational speed of a gas turbine bladed rotor having a plurality of blades, the apparatus comprising:
 - means for providing a magnetic field, said means mounted to a stationary portion of the engine;
 - means for altering said magnetic field, said means associated with at least one of said blades, said means adapted to pass through and alter said magnetic field as said at least one blade rotates with the rotor;
 - means for detecting an alteration in said magnetic field and generating a signal in response thereto, said alternation caused by said altering means; and

a device adapted to use at least said signal to provide said rotational speed.

10. An apparatus for measuring rotation of a gas turbine fan having a plurality of blades, the apparatus comprising: at least one magnetic fan blade, a GMR switch, a magnetic circuit and a signal processor, the magnetic circuit including at least a permanent magnet and an engine casing assembly, the magnetic circuit extending to a position intersected by said fan blade, the GMR switch positioned to detect a magnetic effect caused by said fan blade passing through said circuit, the GMR switch connected to the signal processor, the signal processor adapted to produce rotation information based at least partially on an input received from the GMR switch.

11. A method for measuring the rotation of a bladed rotor comprising a plurality of blades, at least one of the blades made at least partially of an electrically conductive material adjacent a tip portion of the blades, the method comprising:

providing a magnetic field adjacent the blade tips in a manner that the rotating blades pass through the field;

detecting a variation of the magnetic field caused by a movement of the at least one blades through the magnetic field;

detecting a number of said variations; and

computing at least one of rotational position, speed and acceleration of said bladed rotor using at least said number of variations.

12. The method as claimed in claim 11, wherein said detecting is performed using a Giant Magneto Resistance (GMR) device.
13. The method as claimed in claim 11, wherein the bladed rotor is a turbofan fan, and the rotational speed of the fan is computed.
14. A method of acquiring information regarding at least one of position, speed and acceleration of a moving body, the method comprising the steps of:
providing a primary magnetic field;
intermittently passing a magnetically-conductive body through the field to thereby induce a secondary magnetic field on the body;
sensing an occurrence of the presence of the secondary magnetic field; and
using sensed occurrences to determine at least one of body position, speed and acceleration.
15. The method as claimed in claim 14, wherein the presence of the secondary magnetic field is sensed by sensing a variation in the primary magnetic field.
16. The method as claimed in claim 14, wherein the secondary magnetic field produces a distortion in the primary magnetic field, and wherein the step of sensing comprises sensing the distortion.
17. The method as claimed in claim 14, wherein the presence of the secondary magnetic field is sensed by sensing a spatial differential magnetic field

surrounding the body, a spatial differential magnetic field.